

AMENDMENTS TO THE CLAIMS

Claims 1-20 (Cancelled).

21. (Currently Amended) A motor unit comprising:

a motor including a speed reduction mechanism, said speed reduction mechanism including an output shaft having a base end and a distal end opposite said base end and projecting outward from a main section of said speed reduction mechanism;

a case frame containing said speed reduction mechanism;

a cover assembly fitted to an upper side of said case frame and containing a drive control section having a control circuit for driving said motor, said drive control section including:

a first circuit component containing section arranged at said base end of said output shaft along a longitudinal axis of said output shaft, said first circuit component containing section including a printed wiring board and containing signal system circuit components;

a second circuit component containing section arranged at said base end of said output shaft along the longitudinal axis of said output shaft and farther from said base end than said first circuit component containing section, said second circuit component containing section containing power system circuit components, said first circuit component containing section and said second circuit component containing section being arranged in a three-dimensional manner so as to be stacked one above the other with respect to an upper and lower direction, and so as to be located at an upper side of said speed reduction mechanism; and

a connecting line metal bus bar arranged between said first circuit component containing section and said second circuit component containing section so as to electrically connect said signal system circuit components to said power system circuit components, said power system circuit components being mounted directly on said metal bus bar, only said signal system circuit components being mounted on said printed wiring board, and said metal bus bar being operable to absorb noise generated by said power system circuit components and said signal system circuit components.

Claim 22 (Cancelled).

23. (Currently Amended) The motor unit according to claim ~~22~~ 21, wherein said printed wiring board and said power system circuit components in said second circuit component containing section are arranged substantially in parallel with each other, said ~~connecting line metal bus bar~~ being interposed between said printed wiring board and said power system circuit components.

Claims 24 and 25 (Cancelled).

26. (Currently Amended) The motor unit according to claim ~~24~~ 21, further comprising a printed wiring board arranged in ~~said first circuit component containing section and~~ said second circuit component containing section, ~~said signal system circuit components and said power system circuit components being mounted on said printed wiring board;~~ an area of a copper-foil pattern of said wiring board arranged in said first circuit component containing section being smaller than an area of a copper-foil pattern of said wiring board arranged in said second circuit component containing section.

27. (Previously Presented) The motor unit according to claim 21, wherein said second circuit component containing section is located on an upper side of said first circuit component containing section.

28. (Previously Presented) The motor unit according to claim 21, further comprising a heat sink at an outer and upper side of said second circuit component containing section.

29. (Previously Presented) The motor unit according to claim 21, wherein said cover assembly has a two-chamber structure including a first chamber comprising said first circuit component containing section and a second chamber comprising said second circuit component containing section.

30. (Previously Presented) The motor unit according to claim 29, wherein said cover assembly includes a dividing wall separating said first circuit component containing section from said second circuit component containing section.

31. (Previously Presented) The motor unit according to claim 21, wherein said cover assembly includes a dividing wall separating said first circuit component containing section from said second circuit component containing section.

32. (Previously presented) The motor unit according to claim 31, wherein said dividing wall has a connecting hole for allowing said first circuit component containing section to communicate with said second circuit component containing section.

33. (Previously Presented) The motor unit according to claim 32, wherein said cover assembly further includes:

a bottom case having said dividing wall, said first circuit component containing section being located between said dividing wall and said case frame; and

a case cover fitted to said bottom case, said second circuit component containing section being located between said case cover and said dividing wall.

34. (Previously Presented) The motor unit according to claim 31, wherein said cover assembly further includes:

a bottom case having said dividing wall, said first circuit component containing section being located between said dividing wall and said case frame; and

a case cover fitted to said bottom case, said second circuit component containing section being located between said case cover and said dividing wall.

35. (Previously Presented) The motor unit according to claim 34, further comprising power system circuit components fixed to an inner surface of said case cover.

36. (Previously Presented) The motor unit according to claim 35, wherein said case cover has a plurality of fins on an outer surface thereof.

37. (Previously Presented) The motor unit according to claim 35, wherein said case cover is made of aluminum, and black alumite treatment is applied to an outer surface of said case cover.

38. (Previously Presented) The motor unit according to claim 34, wherein said case cover has a plurality of fins on an outer surface thereof.

39. (Previously Presented) The motor unit according to claim 38, wherein said case cover is made of aluminum, and black alumite treatment is applied to an outer surface of said case cover.

40. (Previously Presented) The motor unit according to claim 34, wherein said case cover is made of aluminum, and black alumite treatment is applied to an outer surface of said case cover.

41. (Previously Presented) The motor unit according to claim 21, wherein said first circuit component containing section includes a rotation sensor for detecting a rotation of a motor shaft of said motor.

42. (Previously Presented) The motor unit according to claim 21, wherein said first circuit component containing section includes a position sensor for detecting a rotation angle of a drive shaft of said speed reduction mechanism, said drive shaft being operable to output a decelerated rotation of said motor shaft.

Claim 43 (Cancelled).

44. (Currently Amended) A motor unit comprising:

a motor including:

a yoke having a closed-bottom cylindrical shape;
a permanent magnet fixed on an inner circumferential surface of said yoke;
a motor shaft having a first end rotatably supported in said yoke;
an armature core fixed to said motor shaft;
a coil wound around said armature core;
a commutator fixed to said motor shaft and arranged adjacent to said armature core and electrically connected to said coil;

a brush in slide contact with said commutator; and

a brush holder for retaining said brush;

a speed reduction mechanism engaged with a worm of said motor shaft to decelerate a rotation of said motor shaft and to transfer the decelerated rotation to an output shaft, said output shaft having a base end and a distal end opposite said base end and projecting outward from a main section of said speed reduction mechanism;

a case frame connected to said yoke and containing said speed reduction mechanism; and
a cover assembly including:

a bottom case having a first circuit component containing section arranged at said base end of said output shaft along a longitudinal axis of said output shaft, a second circuit component containing section arranged at said base end of said output shaft along the longitudinal axis of said output shaft and farther from said base end than said first circuit component containing section, a dividing wall arranged between said first circuit component containing section and said second circuit component containing section, said bottom case being arranged such that said first circuit component containing section faces said speed reduction mechanism;

a case cover fitted to said bottom case and shaped to cover said second circuit component containing section;

a printed wiring board in said first circuit component containing section;

signal system circuit components in said first circuit component containing section, and only said signal system circuit components are mounted on said printed wiring board;

power system circuit components in said second circuit component containing section for supplying an electric current to said motor from said signal system circuit components to drive said motor; and

a connecting line metal bus bar electrically connecting said signal system circuit components to said power system circuit components, said power system circuit components being mounted directly on said metal bus bar, and said metal bus bar being operable to absorb noise generated by said power system circuit components and said signal system circuit components.

45. (Previously Presented) The motor unit according to claim 44, wherein said first circuit component containing section includes a rotation sensor for detecting the rotation of said motor shaft.

46. (Currently Amended) A motor unit comprising:

a motor including:

a yoke having a closed-bottom cylindrical shape;

a permanent magnet fixed on an inner circumferential surface of said yoke;

a motor shaft having a first end rotatably supported in said yoke;

an armature core fixed to said motor shaft;

a coil wound around said armature core;

a commutator fixed to said motor shaft and arranged adjacent to said armature core and electrically connected to said coil;

a brush in slide contact with said commutator; and

a brush holder for retaining said brush;

a speed reduction mechanism engaged with a worm of said motor shaft to decelerate a rotation of said motor shaft and to transfer the decelerated rotation to an output shaft, said output shaft having a base end and a distal end opposite said base end and projecting outward from a main section of said speed reduction mechanism;

a case frame connected to said yoke and containing said speed reduction mechanism;

a bottom case having a first circuit component containing section arranged at said base end of said output shaft along a longitudinal axis of said output shaft, a second circuit component containing section arranged at said base end of said output shaft along the longitudinal axis of said output shaft and farther from said base end than said first circuit component containing section, a dividing wall arranged between said first circuit component containing section and said second circuit component containing section, said bottom case being arranged such that said first circuit component containing section faces said speed reduction mechanism;

a case cover fitted to said bottom case so as to cover said second circuit component containing section; and

a cover assembly including:

a printed wiring board in said first circuit component containing section;

first signal system circuit components in said first circuit component containing section, and only said signal system circuit components are mounted on said printed wiring board, said first signal system circuit components including a position sensor;

second power system circuit components in said second circuit component containing section, said second power system circuit components including a FET for supplying an electric current to said motor from said first signal system circuit components in said first circuit component containing section to drive said motor; and

a connecting line metal bus bar electrically connecting said first signal system circuit components to said second power system circuit components, said power system circuit components being mounted directly on said metal bus bar, and said metal bus bar being operable to absorb noise generated by said power system circuit components and said signal system circuit components.

47. (Currently Amended) The motor unit according to claim 46, wherein said first signal system circuit component containing section includes a rotation sensor for detecting the rotation of said motor shaft.

48. (Currently Amended) The motor unit according to claim 46, wherein said case cover has a heat sink; and

said position sensor of said first signal system circuit components is operable to detect a rotation angle of a drive shaft of said speed reduction mechanism, said first signal system circuit components further including a rotation sensor for detecting the rotation of said motor shaft.

49. (Previously Presented) The motor unit according to claim 21, wherein said first circuit component containing section and said second circuit component containing section are arranged above said output shaft.

50. (Previously Presented) The motor unit according to claim 44, wherein said first circuit component containing section and said second circuit component containing section are arranged above said output shaft.

51. (Previously Presented) The motor unit according to claim 46, wherein said first circuit component containing section and said second circuit component containing section are arranged above said output shaft.

52. (Previously Presented) The motor unit according to claim 21, wherein said motor further includes a motor shaft, said output shaft of said speed reduction mechanism being arranged orthogonally with respect to said motor shaft.

53. (Previously Presented) The motor unit according to claim 44, wherein said output shaft of said speed reduction mechanism is arranged orthogonally with respect to said motor shaft.

54. (Previously Presented) The motor unit according to claim 46, wherein said output shaft of said speed reduction mechanism is arranged orthogonally with respect to said motor shaft.